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Chasing the elusive core identity of *Avima* Roewer, 1949 (Arachnida: Opiliones: Agoristenidae)

Поиск неуловимой коренной идентичности *Avima* Roewer, 1949 (Arachnida: Opiliones: Agoristenidae)

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КЛЮЧЕВЫЕ СЛОВА: сенокосцы, Leiosteninae, Южная Америка, таксономия.

ABSTRACT. The holotype of *Avima leucobunus* Roewer 1949, type-species of *Avima*, is studied, and its genital morphology is described for the first time. The *Avima albiornata* species group is here proposed to include three species, i.e. *Avima albidecorata* (Šilhavý, 1979), *A. albiornata* (Goodnight et Goodnight, 1947) and *A. intermedia* (Goodnight et Goodnight, 1947), from Northeastern Venezuela, Trinidad and Tobago, and Suriname. *A. albiornata* (Goodnight et Goodnight, 1947) is herein considered a senior subjective synonym of *A. leucobunus*, syn.n. *Avima leiobuniformis* (Šilhavý, 1973), syn.n. is considered a junior subjective synonym of *A. intermedia*. With the aim of chasing the elusive core identity of *Avima*, a discussion about some diagnostic characters for the genus, which currently includes a large number of unrelated Leiosteninae species, is given.

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РЕЗЮМЕ. Исследован голотип *Avima leucobunus* Roewer 1949, типового вида рода *Avima*, впервые описана морфология его гениталий. Предложена группа видов *Avima albiornata*, включающая три вида, *Avima albidecorata* (Šilhavý, 1979), *A. albiornata* (Goodnight et Goodnight, 1947) и *A. intermedia* (Goodnight et Goodnight, 1947), из северо-восточной Венесуэлы, Тринидада и Тобаго и Суринама. *A. albiornata* (Goodnight et Goodnight, 1947) рассматривается как старший субъективный синоним *A. leucobunus*, syn.n. *Avima leiobuniformis* (Љilhavэ, 1973), syn.n. — младший субъективны синоним *A. intermedia*. С целью поиска неуловимой коренной идентичности *Avima*, обсуждаются некоторые диагностические признаки рода, который ныне включает большое число неродственных видов подсемейства Leiosteninae.

Introduction

The family Agoristenidae Šilhavý, 1973, with 26 genera and 80 species, is a small group of Neotropical harvestmen. Currently, it is divided in three subfamilies: Agoristeninae Šilhavý, 1973 from the Greater Antilles, Globibuninae Kury, 2012 from Ecuador, and Leiosteninae Šilhavý, 1973 from northern South America [Kury, 2013]. Leiosteninae, the most diverse subfamily (12 gen., 62 spp.), is distributed mainly in Andes, Amazon and Caribbean regions of Brazil, Colombia, French Guiana, Guyana, Peru, Suriname, Trinidad and Tobago and Venezuela [García, Pastrana-M., 2021; García, Villarreal, 2020; Villarreal, García, 2021; García *et al*., 2022].

Most of the Leiosteninae species have been described within (or later transferred to) the genus *Avima* Roewer, 1949, which monophyly has not been evaluated and seems to represent a trash basket [García, Villarreal, 2020; Villarreal, García, 2021], where many species have been grouped due to the sole absence of paired tubercles in the scutal area III, without an evaluation of the evolution of this character.

At present, *Avima* has 35 species, distributed throughout northern South America, encompassing the coastal regions of the Caribbean, the Guiana Shield, the Andes and the Amazon. In this work, the type species of the genus is redescribed revealing characters of taxonomic importance associated with genital morphology, which allow defining the nucleus of the ge-

nus, with the purpose of future depuration. At the same time, two specific synonymies were detected and an updated map showing the geographic distribution of the species defined here as the nucleus of the genus is presented.

Historical background

The first known representative of Leiosteninae (i.e. *Vima insignis* Hirst, 1912) was first placed in Phalangodidae subfamily Tricommatinae by Roewer [1923] and afterwards transferred to Agoristenidae by Soares & Avram [1981]. *Vima* Hirst, 1912 underwent a series of changes in its composition and subfamily allocation, and currently consists of two species. For a more complete review of the taxonomic history of this genus, see García & Kury [2020].

Goodnight & Goodnight [1947] described *Vima albiornata* Goodnight et Goodnight, 1947 and *Trinella intermedia* Goodnight et Goodnight, 1947 (the type species of the genus *Trinella*), both from Trinidad and Tobago. Two years later, Roewer [1949] proposed the genera *Avima*, to allocate the species *Avima leucobunus* Roewer, 1949 from Suriname, and *Vimula* Roewer, 1949 to allocate *Vima albiornata*. Šilhavý [1973] proposed the monotypic genus *Leiostenus* with the species *Leiostenus leiobuniformis* Šilhavý, 1973 from Trinidad, and six years later proposed the subspecies *Leiostenus leiobuniformis albidecoratus* from Venezuela [Šilhavý, 1979].

Avram & Soares [1979] gave a detailed redescription (including penis and ovipositor) of *Vimula albiornata* based on material from Cueva Quijano, Caripe.

Soares & Avram [1987: 73, figs 1–10] described the subspecies *Vimula albiornata caripensis* from Cueva Quijano, in northeastern Venezuela, which was subsequently synonymized by Kury [2003] with *Avima albidecorata* [Šilhavý, 1979] (at that moment *Trinella albidecorata*), a species described from the same cave system, and cataloged all the information related to *Trinella* until that moment.

González-Sponga [1987] with base on the little or no dorsal ornamentation of the dorsal scutum and the vestigial grooves and areas, synonymized *Trinella* Goodnight et Goodnight, 1947, *Avima*, *Leiostenus* Šilhavý, 1973 and *Vimula* with *Vima*, and suggested that also *Phalangozea* Muñoz-Cuevas, 1976 could be a synonym of *Vima*.

Pinto-da-Rocha [1996] redefined the concept of *Vima*, restricting it to include only its type species, *Vima insignis* Hirst, 1912; additionally, revalidated *Trinella* to contain the remaining species of *Vima*, resulting in 25 new combinations, and described three new species from Brazil and Venezuela. In this same work, the monotypic genus *Phalangozea* Muñoz-Cuevas, 1975 was proposed as a junior subjective synonym of *Trinella*.

Villarreal & Kury [2009] detected that *Trinella* revalidated by Pinto-da-Rocha [1996] was a junior homonym of *Trinella* Bory de Saint Vincent, 1827 (Protista: Ciliophora), and revalidated the name *Avima*, the next oldest available junior synonym. Posteriorly, only three additional species have been described in the genus, *A. anitas* Porto et Colmenares, 2014, *A. tuttifrutti* García et Pastrana-M., 2021, and *A. wayuunaiki* García, González Vargas et Gutiérrez Estrada, 2022, while *A. nigromaculata* (González-Sponga, 1998) was synonymized with *A. quadrata* (González-Sponga, 1987) [Villarreal et al., 2021a], leaving *Avima* with 35 species at present.

Materials and methods

Individuals of the species were photographed using the cameras Nikon 5200 and Sony Cybershot DSC-V1 attached to the stereomicroscope, and the multiple images of each species at different focal planes were combined with Combine ZP Suite software [Hadley, 2015] to increase the depth of field. The new species were photographed with a Leica M205C stereoscope attached to a Leica DFC450 digital camera and combined with Leica Application Suite (LAS) software version 4.6.2. All resultant photographs were posteriorly edited in Photoshop CC 2014 software.

Drawings of the species were made using a stereomicroscope with *camera lucida*, and digitized with Inkscape 0.91 software. Color descriptions use the standard names of the 267 Color Centroids of the NBS/IBCC Color System [Jaffer, 2001].

The distribution map was made using ESRI ArcGIS 10.4. When listing the examined material, the first order administrative divisions are written in small caps. Geographic coordinates have been transcribed verbatim from the labels and may be in different formats. When no original indications of coordinates were available, those were estimated using Google Maps and GeoNames and placed between square brackets.

The morphological terminology for dorsal scutum follows Kury & Medrano [2016], with the modifications explained in Villarreal & García [2021]: the Epsilon type shape in *Avima* is herein called Epsilon type 2 (subrectangular, anterior and posterior borders slightly narrower than mid-bulge). Penis chaetotaxy and nomenclature follows Kury & Villarreal [2015].

Morphometric abbreviations are: AL — abdomen length, AW — abdomen width, ChB — cheliceral bulla length, CL — carapace length, CW — carapace width, DS — dorsal scutum, DSL — dorsal scutum length, Fe — femur, FT — free tergites, LP — lamina parva, MS — macrosetae of penis, Pa — patella, St — stylus, Ta — tarsus, Ti — tibia, TL — total length, Tr — trochanter. All measurements are in mm unless otherwise noted.

Acronyms of the repositories are: AMNH — American Museum of Natural History, New York (USA); ISER — Institutul de Speologie 'Emile Racovitza' (Romanian Speleological Institute), Bucarest (Romania); MCZ — Museum of Comparative Zoology, Harvard Univeristy, Cambridge (USA); MHNG — Muséum d'histoire naturelle de la Ville de Genève, Geneva (Switzerland); MNRJ — Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro (Brazil); MZTU — Museo di Zoologia, Instituto di Zoologia eAnatomia Comparata, Universitá di Torino (also MZUT, ZMT, now deposited in the Museo Regionale di Scienze Naturali di Torino (MRSN), which belongs to the Regione

Piemonte and not to the University), Torino (Italy); SMF — Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main (Germany); USNM — National Museum of Natural History, Smithsonian Institution, Washington D.C. (USA).

Taxonomy

Order Opiliones Sundevall, 1833
Suborder Laniatores Thorell, 1876
Family Agoristenidae Šilhavý 1973
Subfamily Leiosteninae Šilhavý, 1973
Genus *Avima* Roewer, 1949

Trinella Goodnight et Goodnight 1947: 3 [junior homonym of *Trinella* Bory de Saint Vincent, 1827 (Protista: Ciliophora) and *Trinella* Gray, 1870 (Cnidaria: Parisididae), homonymy first detected by Villarreal-M. & Kury [2009: 65]; junior subjective synonym of *Vima* Hirst, 1912 by González-Sponga [1987: 492]; synonymy disclaimed by Pinto-da-Rocha [1996: 316]; type species: *Trinella intermedia* Goodnight et Goodnight, 1947, by original designation].

Trinella — Soares et Avram, 1981: 76; Pinto-da-Rocha, 1996: 316 (revalidated); Kury, 1997: 344; Kury 2003: 31.

Avima Roewer 1949: 58 [junior subjective synonym of *Vima* Hirst, 1912 by González-Sponga [1987: 492]; junior subjective synonym of *Trinella* Goodnight et Goodnight, 1947 by Pinto-da-Rocha [1996: 316]; type species: *Avima leucobunus* Roewer, 1949, by original designation].

Avima — Caporiacco, 1951: 11; Rambla, 1978: 304; Soares, Avram, 1981: 76; González-Sponga, 1987: 492; Villarreal-M., Kury, 2009: 65.

Vimula Roewer, 1949: 144 [junior subjective synonym of *Vima* Hirst, 1912 by González-Sponga [1987: 492]; junior subjective synonym of *Trinella* Goodnight et Goodnight, 1947 by Pinto-da-Rocha [1996: 316]; type species: *Vima albiornata* Goodnight et Goodnight, 1947, by original designation].

Vimula — Roewer, 1963: 48; Rambla, 1978: 304; Soares, Avram, 1981: 76; González-Sponga, 1987: 492.

Leiostenus Šilhavý, 1973: 131 [junior subjective synonym of *Vima* Hirst, 1912 by González-Sponga [1987: 492]; junior subjective synonym of *Trinella* Goodnight et Goodnight, 1947 by Pinto-da-Rocha [1996]; type species: *Leiostenus leiobuniformis* Šilhavý, 1973, by original designation].

Leiostenus — Soares, Avram, 1981: 75; González-Sponga, 1987: 492.

Phalangozea Muñoz-Cuevas, 1976: 88 [junior subjective synonym of *Trinella* Goodnight et Goodnight, 1947 by Pinto-da-Rocha [1996: 316]; type species: *Phalangozea bordoni* Muñoz-Cuevas, 1976, by original designation].

Phalangozea — Kury, Alonso-Zarazaga, 2011: 49.

TYPE SPECIES. *Avima leucobunus* Roewer, 1949

PLACEMENT. *Avima*, *Trinella* and *Vimula* originally in Phalangodidae: Tricommatinae. Transferred to Agoristenidae: Leiosteninae by Soares & Avram [1981]. *Leiostenus* originally type of Agoristenidae: Leiosteninae. *Phalangozea* originally in Phalangodidae. Transferred to Agoristenidae: Leiosteninae by Šilhavý [1979: 330].

ETYMOLOGY. *Trinella* from the place name Trin(idad) + Latin suffix *-ella*. Gender feminine. *Avima* and *Vimula* are obvious and unimaginative derivations of *Vima*. Gender feminine. *Leiostenus* probably from *Leio*(*bunum*) (which Šilhavý thought resembled it) + truncation of (*Agori*)*stenus*. Gender masculine. *Phalangozea* from Phalango(didae) + toponym (Cueva Francisco Zea). Gender feminine.

Avima albiornata species group

DIAGNOSIS. 1) large to very large harvestmen (DS + leg IV length more than 35 mm), 2) mesotergum faintly delimited, divided in four smooth areas, 3) pedipalps large (more than 5 mm), 4) ocularium low, smooth and without median concavity, 5) yellowish blots on DS (*A. albiornata* and *A. albidecorata*), 6) penis with distal corners of LP rounded, and 7) stylus straight or sub-straight, with smooth dorsal keeled expansion (tiny projection close to apical junction with the stylus in *A. albiornata*).

INCLUDED SPECIES. *Avima albidecorata* (Šilhavý, 1979), *A. albiornata* Goodnight et Goodnight 1947 and *A. intermedia* (Goodnight et Goodnight, 1947).

DISTRIBUTION. Northeastern Venezuela, Trinidad and Tobago, and Suriname (Fig. 5).

Avima albidecorata (Šilhavý, 1979)
Fig. 5.

Leiostenus leiobuniformis albidecoratus Šilhavý, 1979: 330, figs 22–29.

Leiostenus leiobuniformis albidecoratus — Avram, 1987: 81; Rambla, Juberthie, 1994: 221.

Trinella albidecorata: Pinto-da-Rocha, 1996: 316.

Trinella albidecorata — Kury, 2003: 32.

Avima albidecorata: Villarreal-M., Kury, 2009: 65.

Vimula cf. albiornata: Avram, Soares, 1979: 85, figs 1–10.

"*Vimula albiornata caripensis*" [nomen nudum] Soares, Avram, 1981: 76.

Vimula albiornata caripensis Soares, Avram, 1987: 73, fig. 49 [junior subjective synonym of *Leiostenus leiobuniformis albidecoratus* Šilhavý, 1979 by Kury [2003: 32]].

Vima albiornata caripensis: González-Sponga, 1987: 496, figs 630–635.

Trinella caripensis: Pinto-da-Rocha, 1996: 317.

TYPE DATA. Of *V. albiornata caripensis*: ♂ holotype, ♀ allotype, 1 paratype (MZTU); 3 ♂♂ 4 ♀♀ paratypes (ISER?); ***Venezuela***, Monagas, Caripe: Cueva Quijano, 1060 m. Of *Leiostenus leiobuniformis albidecoratus*: ♂ holotype 6 paratypes (MHNG), ***Venezuela***, Monagas, Cueva del Guácharo.

ADDITIONAL EXAMINED MATERIAL. ***Venezuela***: 2 ♂♂ (MNRJ 1575*), Monagas, Cueva del Guácharo, [10.193316° – 63.603436°], 9.VI.1956, leg. L.S. Jordán M.; 1 ♂ 1 ♀ (MNRJ 1576*), same data as previous; 2 ♂♂ 4 ♀♀ (MNRJ 9455*), caverna acima de Cueva del Guácharo, 8.XII.2002, leg. A. Pérez et A. Giupponi; 1 ♂ 2 ♀♀ (MNRJ 9456*), carretera entre Cueva del Guácharo y Caripe, 1000 m, 3.XII.2002, leg. A. Pérez et A. Giupponi; 6 ♂♂ 3 ♀♀ (MNRJ 9457*), Cueva del Guácharo, XII.2002, leg. A. Pérez et A. Giupponi; 3 ♂♂ (MNRJ 9458*), caverna acima de Cueva del Guácharo, XII.2002, leg. A. Pérez et A. Giupponi; 5 ♂♂ 9 ♀♀ (MNRJ 18032*), caverna próxima a la Cueva del Guácharo, 8.XII.2002, leg. A. Pérez et A. Giupponi.

DISTRIBUTION. Venezuela: Monagas (Fig. 5).

REMARKS. Šilhavý (1979: 331, fig. 22) drew the elevation posterior to ocularium and the male genital (very similar to those of *A. albiornata*, except for the absence of the tiny projection in the dorsal keel). However, he showed variations of the white blots on the DS in different specimens. As all the topotypic material of the species that was deposited in the National Museum was lost before an examination of the male penis, we prefer to maintain it as a separated species.

Avima albiornata (Goodnight et Goodnight, 1947)
Figs 1, 2, 3A–C, 5.

Vima albiornata Goodnight et Goodnight, 1947: 4, fig. 5.

Vima albiornata — Turk, 1948: 258.

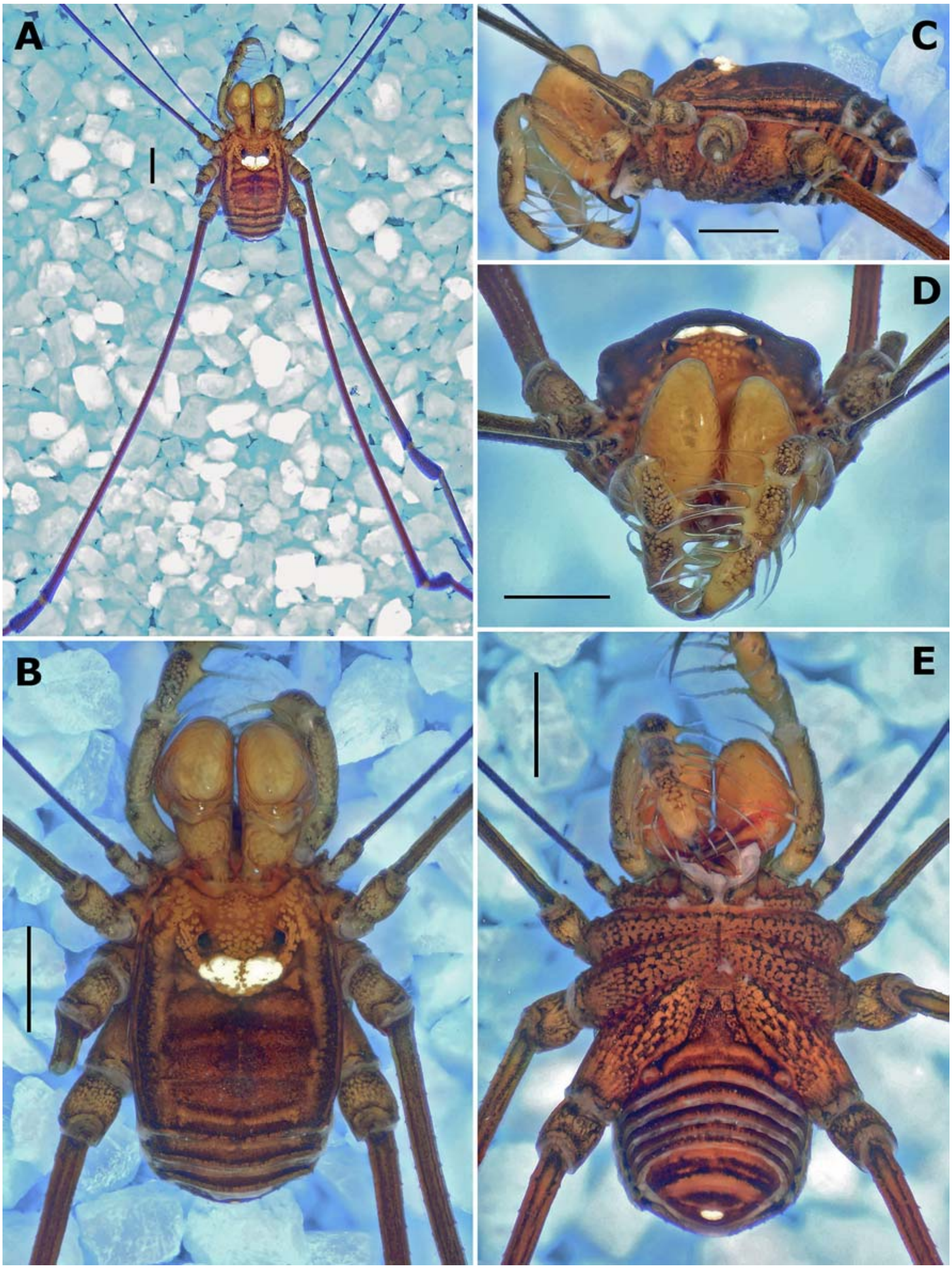


Fig. 1. *Avima albiornata* (Goodnight et Goodnight, 1947) (MNRJ 19622*) male. Habitus: A — panoramic view, B — dorsal view, C — lateral view, D — frontal view, E — ventral view. Scale bars: A–C, E — 1 mm, D — 0.5 mm.

Рис. 1. *Avima albiornata* (Goodnight et Goodnight, 1947) (MNRJ 19622*), самец. Внешний вид: A — общий вид, B — дорсально, C — латерально, D — фронтально, E — вентрально. Масштаб: A–C, E — 1 мм, D — 0,5 мм.

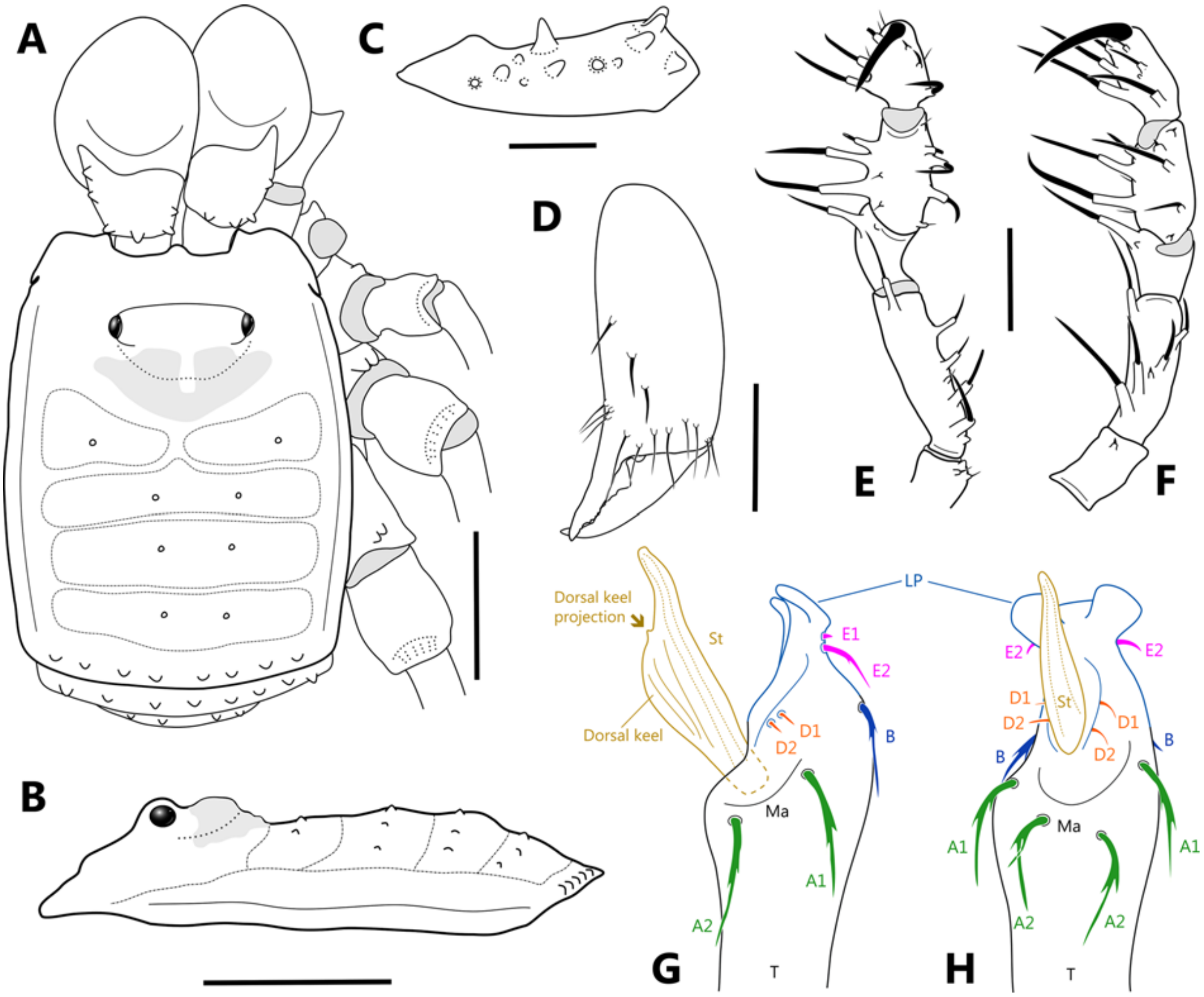


Fig. 2 *Avima leucobunus* Roewer, 1949 (SMF 1533/8) male holotype. Dorsal Scutum: A — dorsal view, B — lateral view; C — coxa I; D — left chelicera, frontal view; left pedipalp: E — ventroectal view, F — ventromesal view; penis: G — lateral view, H — dorsal view. Abbreviations: LP — lamina parva, Ma — malleus, St — stylus, T — truncus. Scale bars: A, B, D–F — 1 mm, C — 0.5 mm.

Рис. 2. *Avima leucobunus* Roewer, 1949 (SMF 1533/8), голотип самец. Дорсальный скутум: A — дорсально, B — латерально; C — тазик I; D — левая хелицера, фронтально; левая педипальпа: E — вентроэктально, F — вентромезально; пенис: G — латерально, H — дорсально. Сокращения: LP — lamina parva, Ma — malleus, St — стилус, T — ствол. Масштаб: A, B, D–F — 1 мм, C — 0,5 мм.

Vimula albiornata: Roewer, 1949: 144.

Vimula albiornata — Avram, Soares, 1979: 85

Vimula albiornata albiornata: Soares, Avram, 1987: 74.

Trinella albiornata: Pinto-da-Rocha, 1996: 317.

Trinella albiornata — Kury, 2003: 32

Avima albiornata: Villarreal-M., Kury, 2009: 65.

Avima leucobunus Roewer, 1949: 58, fig. 112; Soares, Avram, 1982: 26; Villarreal-M., Kury, 2009: 66. **syn.n.**

"*Trinella leucobuna*" [unjustified emendation]: Pinto-da-Rocha, 1996: 317.

Trinella leucobunus: Kury, 2003: 33.

TYPE DATA. Of *A. leucobunus*: ***Suriname***: ♂ holotype (SMF 1533/8), Paramaribo, Paramaribo, [5.861777° -55.201445°], examined. Of *A. albiornata*: ***Trinidad and Tobago***: holotype (examined by photograph) (AMNH), Trinidad, Diego Martín, [10.735654° -61.549403°].

ADDITIONAL EXAMINED MATERIAL. Of *A. albiornata*: ***Trinidad and Tobago***: 1 ♂ (MNRJ 19619*), Trinidad, Arima, Brasso Seco Village, Marianne watershed, [10.751008° –61.284738°], 134 m, 11.II.2016, leg. L. Blondel et S. Cally; 1 ♀ (MNRJ 19620*), same data as previous; 1 ♀ (MNRJ 19621*), same data as previous; 1 ♂ (MNRJ 19622*), same data as previous; 1 ♂ (MNRJ 19623*), same data as previous; 1 juvenile (MNRJ 19626*), Arima, Brasso Seco Village, Paria watershed, [10.761620° –61.250471°], 146 m, 14.II.2016, leg. L. Blondel et S. Cally; 1 ♂ (MNRJ 19632*), Arima, Morne Bleu Mountain, [10.724382° –61.308791°], 618 m, 16.II.2016, leg. L. Blondel et S. Cally; 1 ♀ (MNRJ 19633*), same data as previous; 1 ♂ (MNRJ 19637*), Arima, Morne La Croix, Yarra watershed, [10.738988° –61.327746°], 36 m, 19.II.2016, leg. L. Blondel et S. Cally; 1 ♀ (MNRJ 19638*), same data as previous; 1 ♀ (MNRJ 19645*), Las Cuevas, [10.781887° –61.386687°], 42 m, 22.II.2016, leg. L. Blondel et S. Cally.

REDESCRIPTION. Male Holotype of *A. leucobunus* (SMF 1533/8). Measurements: DSL (3.0), CL (1.3), CW (2.2), AL (1.7), AW (2.5), IOD (0.8), ChB (0.5). Pedipalp (Tr/Fe/Pa/Ti/Ta/Claw/**TL**) (0.4/1.0/0.4/0.6/0.5/0.6/**3.5**). Legs (Tr/Fe/Pa/Ti/Mt/Ta/**TL**): I (0.3/6.2/1.0/4.0/8.3/1.0/**20.8**); II (0.5/12.0/1.0/10.0/16.0/4.5/**44.0**); III (0.6/9.0/1.1/5.0/10.3/

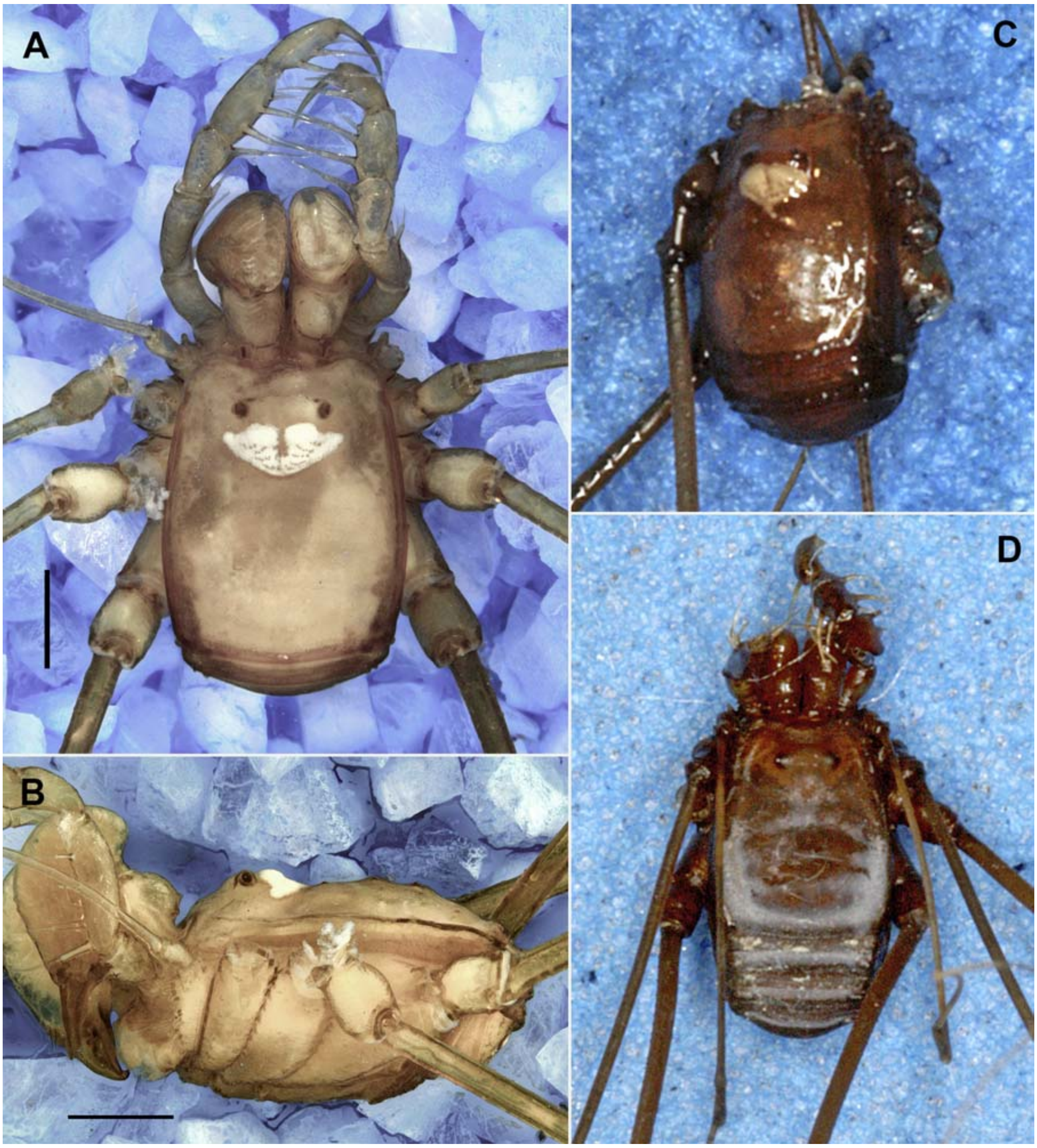


Fig. 3. A–B — male holotype of *Avima leucobunus* Roewer, 1949: A — dorsal view, B — lateral view; C — holotype (possibly male) of *Avima albiornata* (Goodnight et Goodnight, 1947) (AMNH), dorsolateral view; D — female or beta male of *Trinella intermedia* (AMNH), dorsal view. Scale bars: 1 mm. Pictures by: Andrés García (A, B) and Ricardo Pinto-da-Rocha (C, D).

Рис. 3. A–B — *Avima leucobunus* Roewer, 1949, голотип самец: A — дорсально, B — латерально; C — голотип (возможно самец) *Avima albiornata* (Goodnight et Goodnight, 1947) (AMNH), дорсолатерально; D — самка или бета-самец *Trinella intermedia* (AMNH), дорсально. Масштаб: 1 мм. Фото Andrés García (A, B) и Ricardo Pinto-da-Rocha (C, D).

2.7/**28.7**); IV (0.6/12.8/1.4/7.0/15.0/3.0/**39.8**). *Dorsum***.** DS outline epsilon, type 2. Anterior and lateral margins of DS smooth. Ocularium low, smooth and without median concavity. Post-ocular region of carapace with an elliptical hillock, provided with a yellowish lunate blot (Figs 1A–D, 2A,B, 3A–C). Mesotergum slightly delimited, divided into four unarmed areas: I divided medially into two halves; areas II–IV undivided (Figs 1B, 2A,B). Posterior margin of DS substraight with few granules. Free tergites I–III with some granules (Fig. 1E). *Venter*. Coxa I with a longitudinal row of tubercles (the distal one visible in dorsal view) and one conical large tubercle on the anteroproximal margin (the left coxa I has two conical large tubercles) (Figs 1E, 2C); coxae II–IV with some granules; coxa II longer than coxa I; coxa III longer than coxae II; coxa IV backward projected. Stigmata oval and transverse (Fig. 1E). *Chelicera*. Basichelicerite quadrate in dorsal view, with well-marked bulla, two ectal, three anterior and two mesal tubercles. Hand swollen,

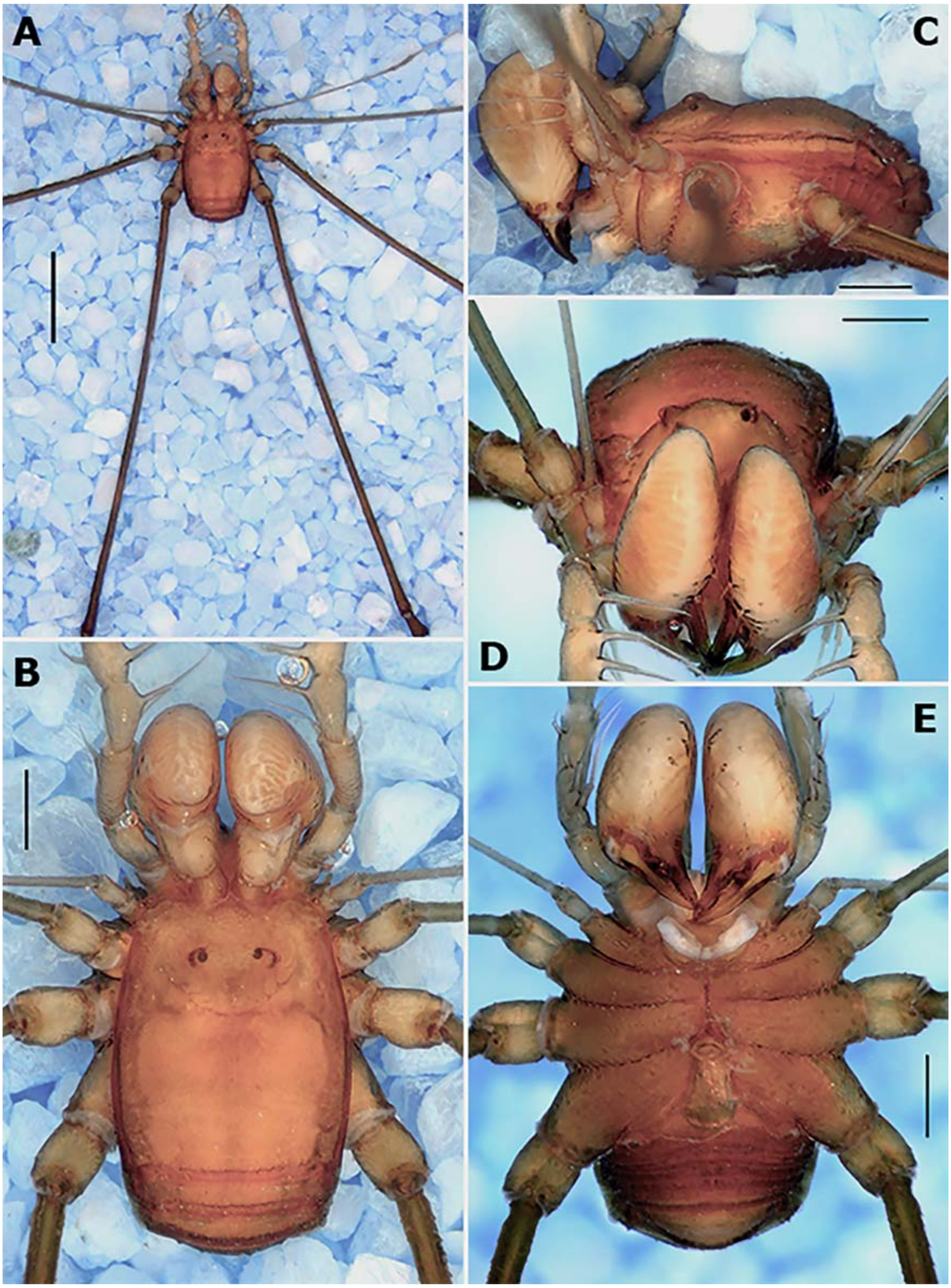


Fig. 4. *Avima intermedia* (Goodnight et Goodnight, 1947) (USNM AK 10*) male. Habitus: A — panoramic view, B — dorsal view, C — lateral view, D — anterior view, E — ventral view. Scale bars: 1 mm.

Рис. 4. *Avima intermedia* (Goodnight et Goodnight, 1947) (USNM AK 10*), самец. Внешний вид: A — общий вид, B — дорсально, C — латерально, D — спереди, E — вентрально. Масштаб: 1 мм.

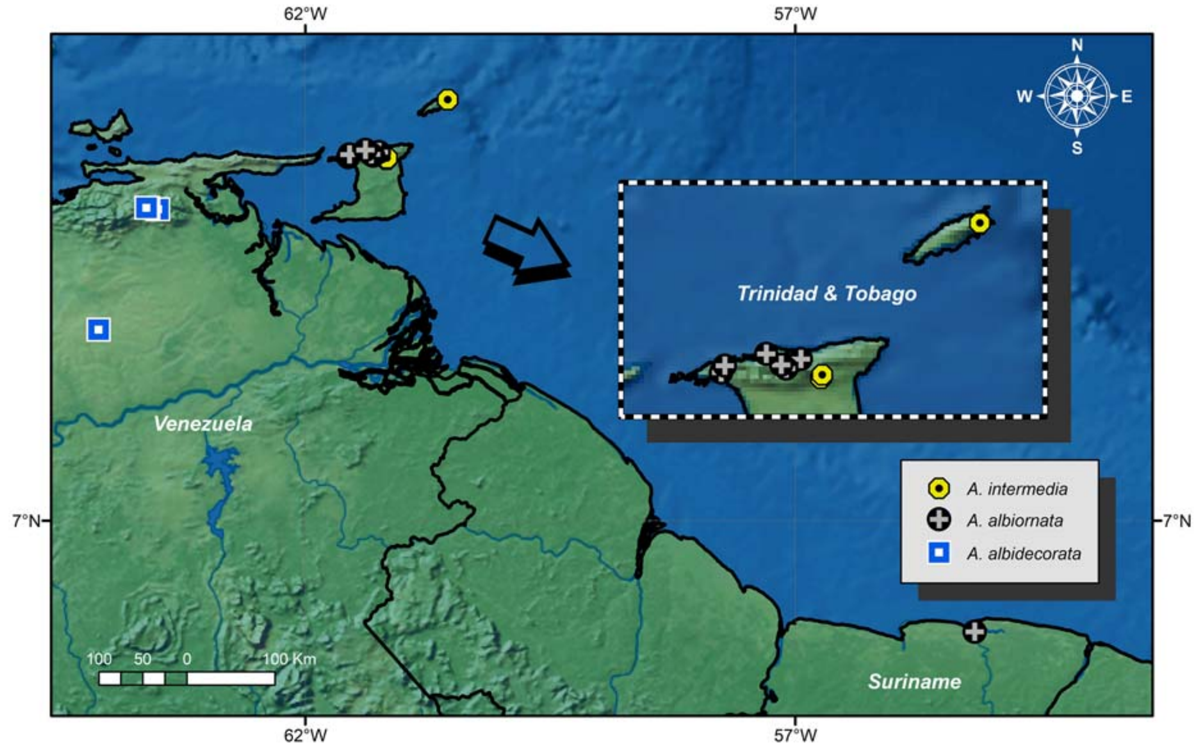


Fig. 5. Map showing the distribution of *Avima albidecorata*, *A, albiornata* and *A. intermedia* in Northeastern South America.
Рис. 5. Карта распространения *Avima albidecorata*, *A, albiornata* и *A. intermedia* в северо-восточной части Южной Америки.

with setiferous tubercles of different sizes (reaching the medial and posterior region of the hand), and with one tubercle near the joint of the movable finger. Fixed finger with the inner surface finely grooved. Movable finger with one trapezoid, sub-basal tooth and with a dentate distal inner surface (Fig. 2D). *Pedipalps*. Trochanter with one subapical tubercle on the ventral face. Femur with a ventroectal row of five setiferous tubercles (the two basalmost largest, the medial small, and the two distalmost medium-sized), and one large ventromesal setiferous tubercle in the apical portion. Patella with one large mesal setiferous tubercle. Tibia ectal iIII, mesal IIi. Tarsus ectal IIi, mesal Iii (Fig. 2E,F). *Legs*. Increasing in thickness from leg I to leg IV, unarmed (Fig. 1A). Leg I filiform; coxa I with one dorsoanterior and one dorsoposterior tubercles. Coxa II with one dorsomedial and one retrolateral tubercle. Coxa III with one anterior, one posterior and one large retrolateral tubercle. Coxa IV with two small dorsodistal tubercles; Fe IV length four times DS length (Fig. 1A); Pa IV with one medium-sized tubercle on prolateral face, two large tubercles on prolateroventral face, and on large tubercle on retroventral face; Ta I–II each with one smooth claw; Ta III–IV with two subparallel smooth claws and without tarsal process. *Penis*. LP small (width twice the height) and depressed, with anterolateral rounded corners (ear-shaped) dorsoapically pointed (Fig. 2G,H). Malleus with two pairs of branched MS-A; one pair of branched MS-B; MS-C absent; two pairs of short MS-D located in a keel between the ventral part of the LP and the base of the stylus; MS-E2 large and triffid, MS-E 1 short and conical, located slightly distal to MS-E2 on the ventral side of the LP (Fig. 2G,H). Stylus elongated, mostly straight (curved dorsally at the apex), and surpassing the LP; dorsal keel present, with a tiny projection close to apical junction with the stylus (indicated by an arrow in Fig. 2G); tip truncated, dorsally projected. *Color (in alcohol)*. Carapace, chelicerae and pedipalps Moderate Orange Yellow (71). Lateral borders of DS and free tergites Deep Yellowish Brown (75). Legs I–IV Dark Orange Yellow (72). Dorsal lunate blot Pale Yellow (89) (Fig. 3). Free tergite III with a white elliptical blot (Fig. 1E).

DISTRIBUTION. Trinidad and Suriname.

REMARKS. In the description of *A. albiornata*, Goodnight et Goodnight [1947] stated that the species exhibits, posterior to the eye tubercle, *"an elevation equal in height to the eye tubercle, but somewhat constricted in the middle"*. Posteriorly, they describe "*A white dot in the median portion of the third free tergite"*. By examination of the holotype of *A. leucobunus* (Figs 2, 3A,B), and comparing with the holotype (Fig. 3C) and topotypic material of *A. albiornata* (Fig. 1), we propose the synonymy.

Avima intermedia (Goodnight et Goodnight, 1947) Figs 3D, 4, 5.

Trinella intermedia Goodnight et Goodnight, 1947: 3, fig. 8.

Trinella intermedia — Soares, Avram, 1981: 95; Soares, Avram, 1982: 19; Pinto-da-Rocha, 1996: 317; Kury, 2003: 33

Avima intermedia: Villarreal-M., Kury, 2009: 66.

Leiostenus leiobuniformis Šilhavý, 1973: 131, figs 46–50. **syn.n.**

Leiostenus leiobuniformis — Soares, Avram, 1981: 75; Soares, Avram, 1987: 76; Avram, 1987: 81.

Trinella leiobuniformis: Pinto-da-Rocha, 1996: 317; Kury, 2003: 33.

Avima leiobuniformis: Villarreal-M., Kury, 2009: 66.

TYPE DATA. TRINIDAD AND TOBAGO: ♀ holotype (examined by photograph) (AMNH), Trinidad, St. Augustine, [10.659131° –61.402036°], 12.XI.1944, leg. R.H. Montgomery. Of *A. leiobuniformis*: ***Trinidad and Tobago***: ♂ holotype (not examined) (MCZ), Trinidad, [10.696543° –61.523562°].

ADDITIONAL EXAMINED MATERIAL. ***Trinidad and Tobago***: Trinidad, 1 ♂ (MNRJ 19627*), Arima, Brasso Seco Village, Paria watershed, [10.761620° –61.250471°], 146 m, 14.II.2016, leg. L. Blondel et S. Cally; 1 ♀ (MNRJ 19628*), same data as previous; 1 ♀ (MNRJ 19629*), same data as previous; 1 ♂ (MNRJ 19630*), same data as previous; 1 ♂ (MNRJ 19631*), same data as previous; 1 ♂ (MNRJ 19643*), Valencia, Cumaca, Turure river waterfalls, [10.687168° –61.171555°], 191 m, 21.II.2016, leg. L. Blondel et S. Cally; 1 ♀ (MNRJ 19644*), same data as previous; 1 ♂ (USNM AK 11*), St. Andrew Co., Valencia ward, Oropouche cave, 10°42' N 61°10"W, 150 m, 3.II.1984, leg. J. Coddington. Tobago, trail connecting the Speyside overlook to Pigeon Peak, 11°17.845 N 60°32.934 W [11.296407° –60.547692°], 10–14.X. 2010 [Townsend *et al*., 2012]. Of *A. leiobuniformis*: ***Trinidad and Tobago***: 3 ♂♂ 7 ♀♀ (USNM AK 10*), Trinidad, St. Andrew Co., Valencia ward, Oropouche cave, 10°42' N 61°10"W, 150 m, 3.II.1984, leg. J. Coddington.

REMARKS. The sex of the holotype of *Avima intermedia* is not mentioned in the original description [Goodnight, Goodnight, 1947], but it seems to be a female (Figure 3D). This species inhabits the same region as *A. leiobuniformis* and its external morphology is very similar (Fig. 4). Townsend *et al*. [2012] offered photographs of *A. intermedia* (Fig. 1C, being the source of the new record from Tobago) and its genitalia (Fig. 5C, D), resembling that of *A. leiobuniformis* [Šilhavý, 1973: fig. 50]. For that reason, we propose that both species must be synonymized.

Discussion

The original description of Leiosteninae state that it comprises individuals with unarmed eye mound, inconspicuous scutal areas and first mesotergal area with or without median line, first coxae with a row of hair pointed tubercles, very long and fine legs, third femur longer than body size and pedipalps relatively long [Šilhavý, 1973]. The idea that different harvestmen genera were "Leiosteninae-like", was used by some authors as a criteria to allocate them in the subfamily, i.e., Šilhavý [1979] with *Phalangozea* ; Soares, Avram [1981] with *Vima*, *Trinella*, *Avima*, *Vimula* and *Paravima* Caporiacco, 1951.

However, the problems arose more acutely when González-Sponga [1987] proposed that some of these genera must be synonymized with *Vima*, without a revision of its type material and/or ignoring the genital morphology and the degree of endemism of some groups. In fact, *Avima* shows a widespread distribution in South America [García, Villarreal, 2020], mostly because none of the works related to alpha taxonomy and/or nomenclature have studied its type species nor used it in a phylogeny, making the present concept of *Avima* outdated and useless.

Nowadays, *Avima* has 35 species, most of them presumably unrelated because of have being grouped by sharing smooth mesotergal areas, but in disregard of genital characters (such as stylus shape/ornamentations and chaetotaxy) that have shown to be useful for genera delimitation in Leiosteninae, e.g. García & Villarreal [2020] for *Leptostygnus* Mello-Leitão, 1940; García & Kury [2020] for *Vima*; Ahumada *et al*. [2020] for *Barinas* González-Sponga, 1987; Villarreal & García [2021] for *Muscopilio* Villarreal et García, 2021.

Here we have made an effort to detect diagnostic characters for *Avima* with the aim of defining the core of the genus and enable future studies that may delimit the real composition of this complex group. So, we propose the *Avima albiornata* species group whose members inhabit Northeastern Venezuela, Trinidad and Tobago, and Suriname (Fig. 5) and that share some characters above listed (see diagnosis). A similar distribution with species occurring in the Caribbean (Venezuela and Minor Antilles) and Guyana is found in the genus *Stygnoplus* Simon, 1879 as defined in Villarreal *et al*. [2021b]. Not surprisingly, Trinidad shares some harvestmen species with the northeastern region of Venezuela, as recorded by González-Sponga [1992], Kury [2003] and Townsend *et al*. [2012] e.g. *Phareicranaus calcariferus* (Simon, 1879) (Cranaidae), *Rhopalocranaus albilineatus* Roewer, 1932 (Manaosbiidae) and *Paecilaema inglei* Goodnight et Goodnight, 1947 (Cosmetidae).

When comparing the diagnostic characters of the group within other genera/species of Leiosteninae, we found that:

1) A large to very large body size occurs mainly in *Andrescava* Roewer, 1957, some "*Avima*" species from Andean caves [e.g. *A. checkeleyi* (Rambla, 1978), *A. bordoni* (Muñoz-Cuevas, 1976), *A. falconensis* (González-Sponga, 1987), *A. troglobia* (Pinto-da-Rocha, 1996)], *A. tuttifrutti* García et Pastrana, 2021, and *Paravima*.

2) The mesotergum is poorly delimited in the majority of Leiosteninae, except *Andrescava*, "*Avima*" *bubonica* (González-Sponga, 1987), *Barinas*, *Barlovento*, *Leptostygnus*, *Muscopilio* and *Sabanilla.*

3) The pedipalps length in Leiosteninae tend to be less than 5 mm, except in the core of *Avima* (mentioned above), *Avima venezuelica* (Soares et Avram, 1981), and the "*Avima*" species from caves, including troglomorphic forms (*A. azulitai* (Rambla, 1978), *A. bordoni*, *A. chapmani* (Rambla, 1978), *A. checkeleyi*, *A. falconensis*, *A. troglobia*). Elongation of appendages, such as antennae, legs, pedipalps, etc. have been referred to strictly cave species, so it could be an independently acquired condition.

4) The ocularium is low in the Leiosteninae, except in *A. chiguaraensis* (González-Sponga, 1987), *A. flavomaculata* (González-Sponga, 1987), *A. granulosa* (González-Sponga, 1998), and *A. subparamera* (González-Sponga, 1987); the ocularium is smooth in Leiosteninae, with the exception of *Muscopilio* and *Barinas piragua* Ahumada et García, 2020; the median concavity is present only in the ocularium of *Muscopilio*, *Leptostygnus*, *Ocoita*, *Paravima,* and some "*Avima*" species, as *A. palpogranulosa* (González-Sponga, 1981), *A. plana* (Goodnight et Goodnight, 1949), *A. quirozi* (González-Sponga, 1981), *A. severa* (Soares et

Avram, 1981) and *A. vigirima* (Villarreal-M.et Rodríguez-M., 2003).

5) The yellowish blots on DS appear in particular cases in Leiosteninae, i.e., *Leptostygnus marchantiarum* (González-Sponga, 1987) and *L. yarigui* García et Villarreal; 2020, *Avima albimaculata* (González-Sponga, 1998), *A. flavomaculata, A. subparamera*, *A. tuttifrutti*, *A. venezuelica;* and *Vima insignis*.

6) The penis with rounded distal corners of the LP is a character observed in *Nemastygnus*, *A. matintaperera, A. palpogranulosa*, *A. severa*, as well as *Ocoita*, *A. checkeleyi*, *A. falconensis* and *A. venezuelica* [García, Villarreal, 2020].

7) The straight or sub-straight stylus with a smooth dorsal keel is a character found in the majority of the Leiosteninae, with exception of *A. tuttifrutti* and *A. soaresorum*, as well as *Barinas*, *Ocoita*, *Paravima*, *Vima* and *Vimina* [García, Villarreal, 2020].

Except the species here defined as *Avima albiornata* species group, the remaining 31 species currently included in the genus should be reviewed on a case-by-case basis to determine their affinities within the family. So, probably, a cladistic analysis would be conducive to resolving this issue.

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